Algebra II

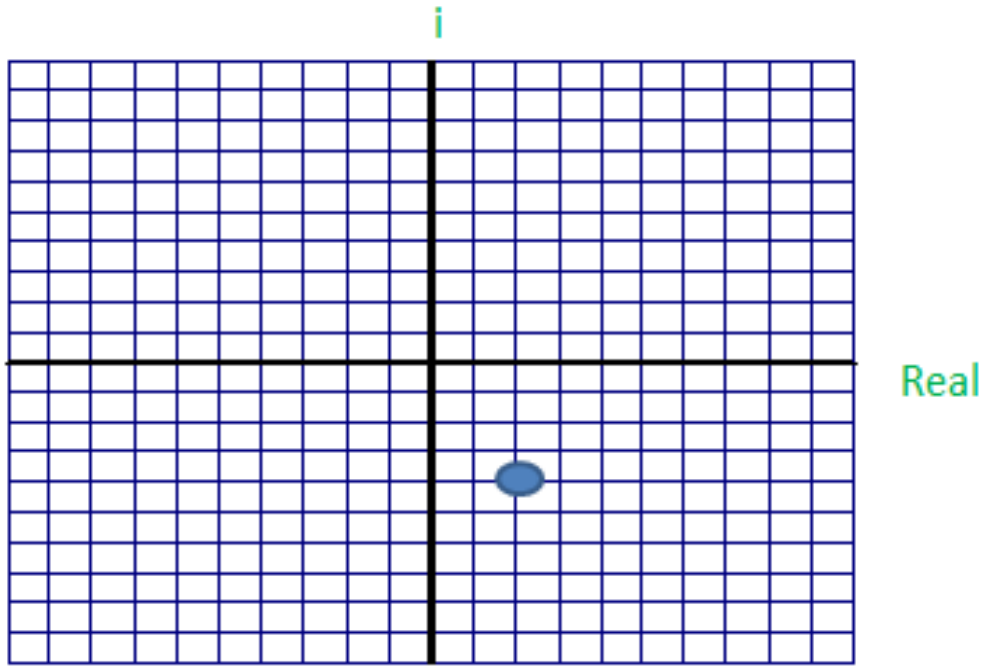
Reminder:

Chapter 8 Test (sections 8.1.1 to 8.3.2)
Tomorrow

. Given the complex number $2-4i$

a. Sketch a graph

b. Find the absolute value



$$c = 2\sqrt{5}$$

$$2^2 + 4^2 = c^2 = 20$$

Find all real and complex roots for the graph shown below.

$$x = 2$$

	x^2	6x	13
X	x^3	$6x^2$	13x
-2	$-2x^2$	-12x	-26

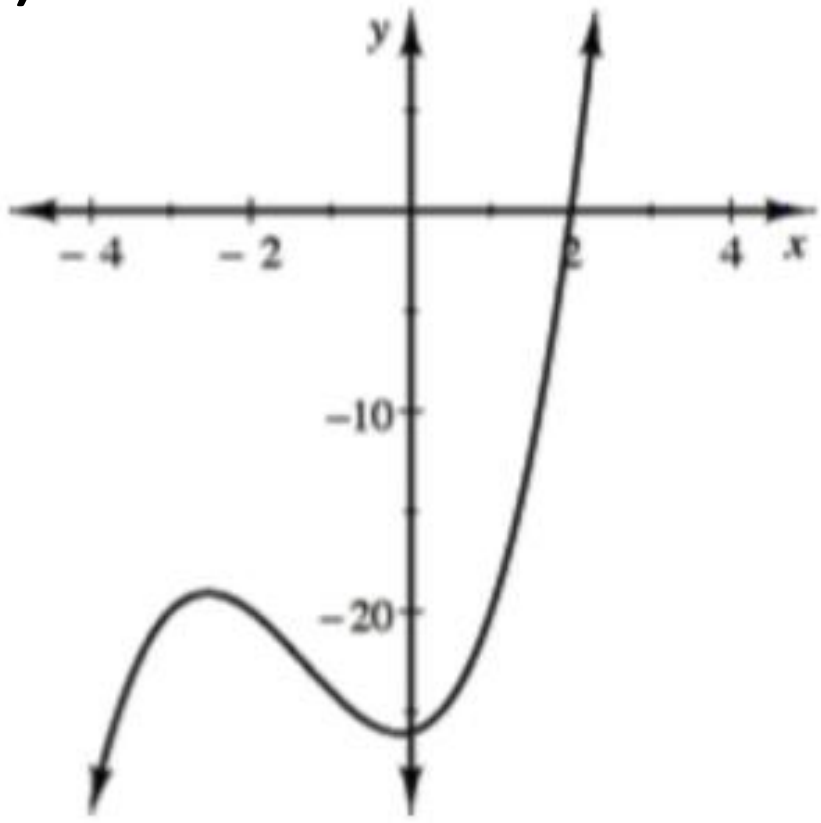
$P(x) = x^3 + 4x^2 + x - 26$

$$P(x) = (x-2)(x^2+6x+13)$$

$$x = \frac{-6 \pm \sqrt{36-4(1)(13)}}{2(1)} = \frac{-6 \pm \sqrt{-16}}{2}$$

$$x = \frac{-6 \pm 4i}{2} = -3 \pm 2i$$

$P(x) = x^3 + 4x^2 + x - 26$

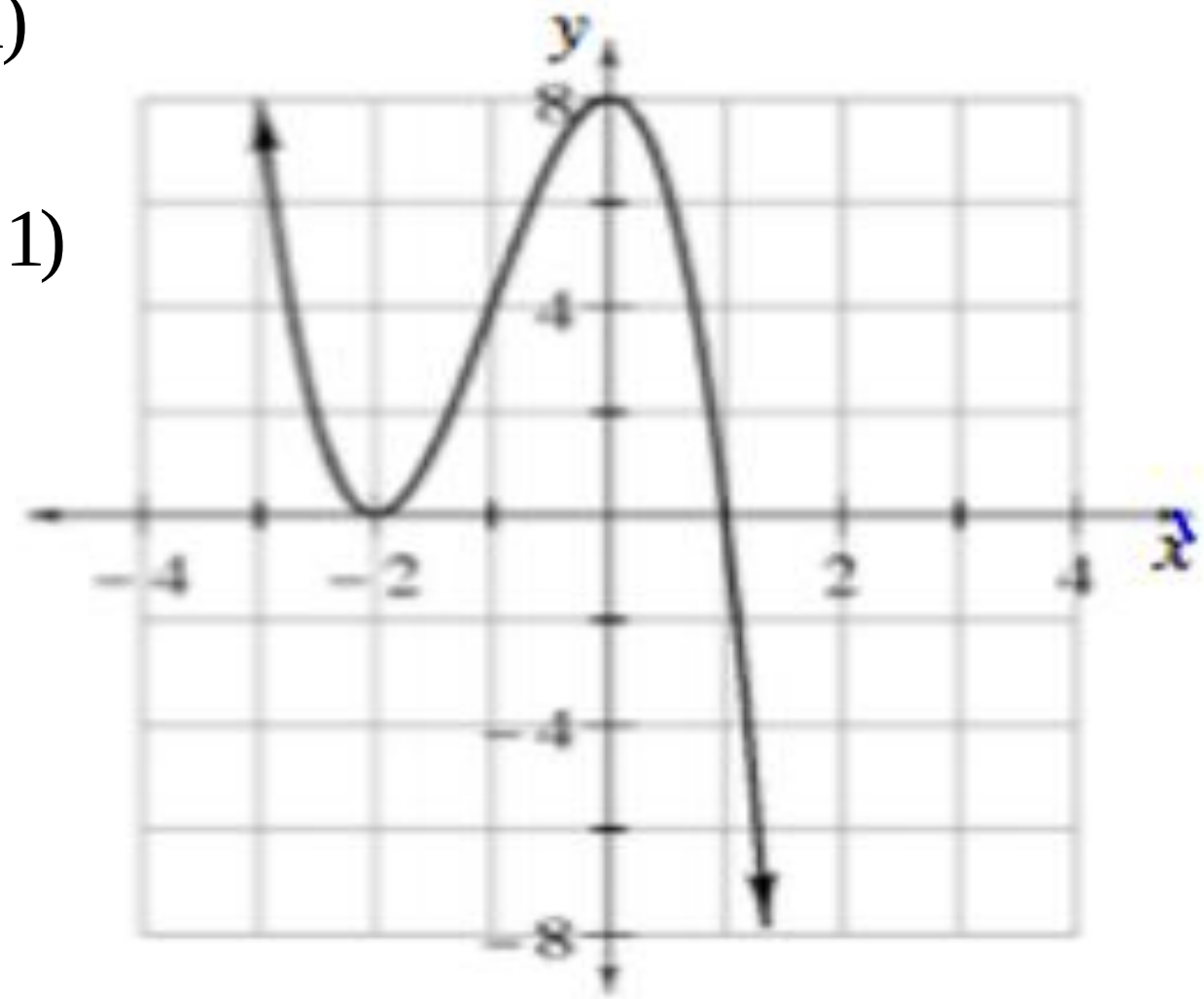


$$x = 2, x = -3+2i, x = -3-2i$$

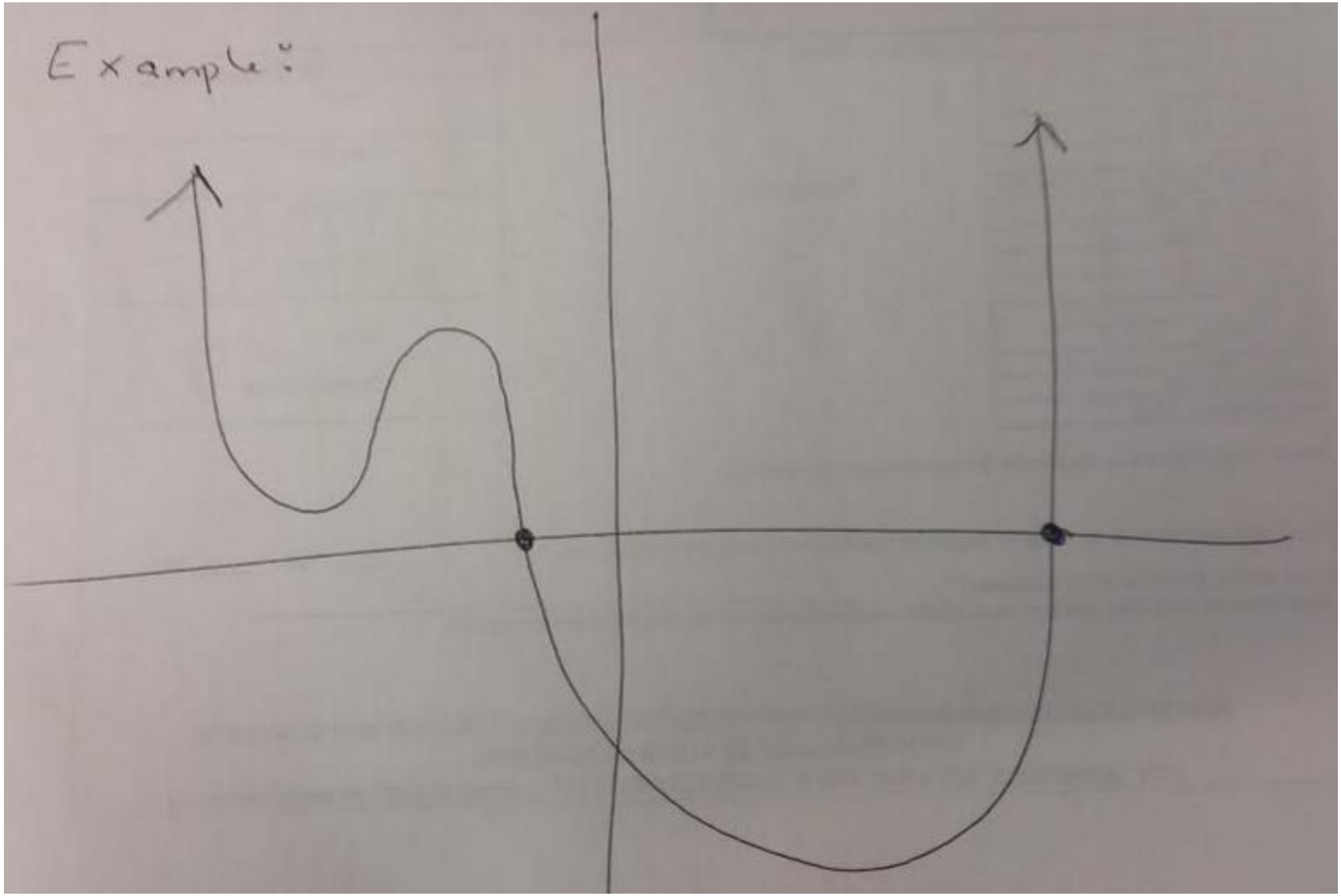
Write the equation for the graph shown below.

$y = a(x+2)^2(x-1)$

$y = -2(x+2)^2(x-1)$



Make a sketch of a graph $p(x)$ so that $p(x) = 0$ would have 2 real and 2 complex solutions.



Solve the quadratic equation. Be sure to simplify completely, record solution in exact form.

$$4x^2+10x+9=0$$

$$x=\frac{-10\pm\sqrt{-44}}{8}=\frac{-10\pm\sqrt{-1}\sqrt{4}\sqrt{11}}{8}$$

$$=\frac{-10\pm 2i\sqrt{11}}{8}$$

$$x=\frac{-5\pm i\sqrt{11}}{4}$$

A fourth degree polynomial has real roots at 1, -3, a double real root at 2, and passes through the point (3, 6).
Write the particular equation of the function.

$$y = a(x-1)(x+3)(x-2)^2$$

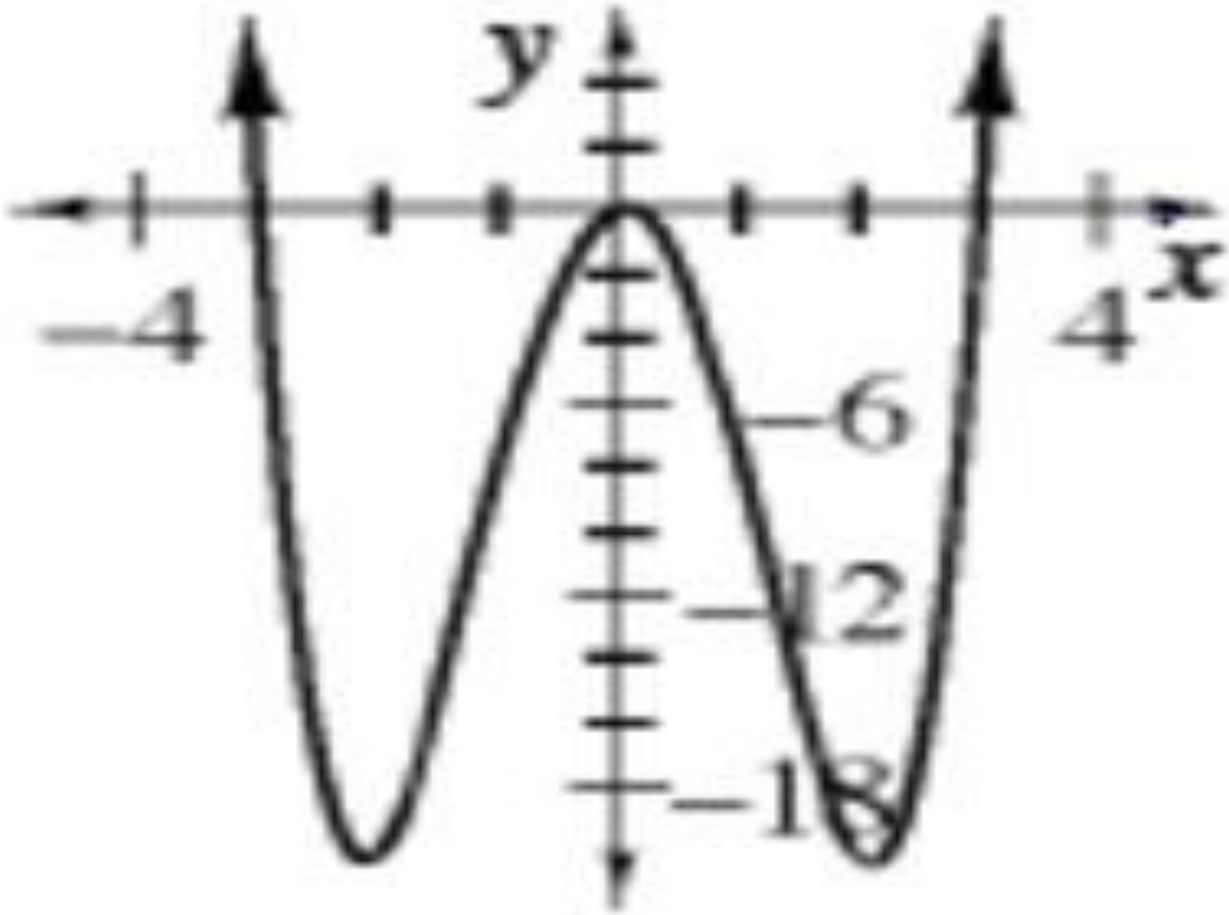
$$6 = a(3-1)(3+3)(3-2)^2$$

$$6 = a \cdot 12$$

$$\frac{1}{2} = a \qquad y = \frac{1}{2}(x-1)(x+3)(x-2)^2$$

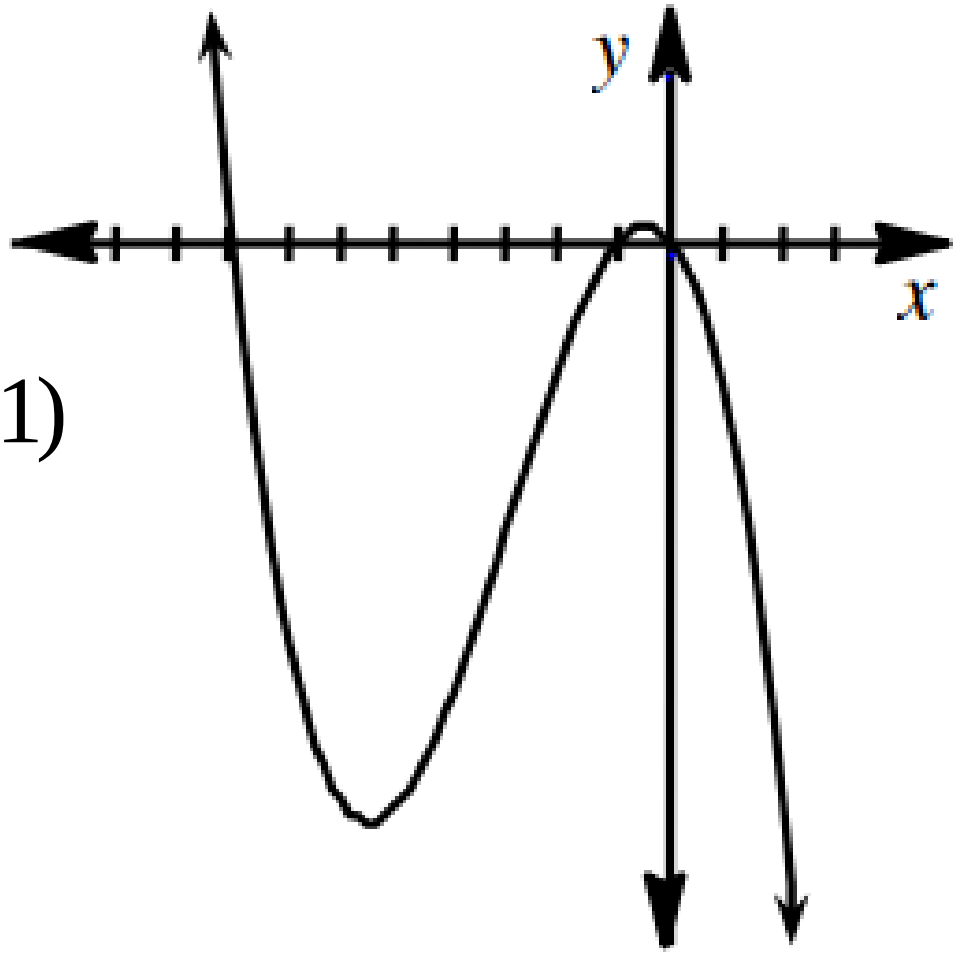
Write the equation for the graph shown below.

$$y = x^2(x-3)(x+3)$$



Write a possible equation for the graph shown below.

$$P(x) = -x(x+8)(x+1)$$



Solve the quadratic equation. Be sure to simplify completely, record solution in exact form.

$$y = 3x^2 - 6x + 5$$

$$x = \frac{6 \pm \sqrt{-24}}{6} = \frac{6 \pm \sqrt{-1} \cdot \sqrt{4} \cdot \sqrt{6}}{6}$$

$$= \frac{6 \pm 2i\sqrt{6}}{6}$$

$$x = 1 \pm \frac{i\sqrt{6}}{3}$$

Simplify, no negative exponents or decimals.

$$\frac{5x^3y^6}{3x^6y^2} \div \frac{25x^4y^4}{9x^6} =$$

$$= \frac{5x^3y^6}{3x^6y^2} \cdot \frac{9x^6}{25x^4y^4} = \frac{5 \cdot 9 \cdot x^9 \cdot y^6}{3 \cdot 25 \cdot x^{10} \cdot y^6} = \frac{3}{5x}$$

Solve the quadratic equation. Be sure to simplify completely, record solution in <u>exact</u> form. $y=(x-2)^2+60$

$$0=(x-2)^2+60$$

$$-60=(x-2)^2$$

$$\sqrt{-60}=|x-2|$$

$$x-2=\pm 2i\sqrt{15}$$

$$x=2\pm 2i\sqrt{15}$$

$$0=x^2-4x+64$$

$$x=\frac{4\pm\sqrt{-240}}{2}$$

$$x=\frac{4\pm\sqrt{-1}\sqrt{16}\sqrt{15}}{2}$$

$$x=\frac{4\pm 4i\sqrt{15}}{2}$$

$$x=\frac{2\pm 2i\sqrt{15}}{}$$

Find the equation of a parabola with roots

$$x = 3 \pm 6i$$

$$y = x^2 - 6x + 45$$

Solve the quadratic equation. Be sure to simplify completely, record solution in exact form.

$$(x+3)^2+12=-36$$

$$x=-3\pm 4i\sqrt{3}$$

Subtract the rational expression

$$\frac{x+2}{x-6} - \frac{x^2+5x+14}{x^2-2x-24}$$

$$(x-6)(x+4)$$

$$= \frac{(x+4)\cdot(x+2)}{(x+4)\cdot(x-6)} - \frac{(x^2+5x+14)}{(x-6)(x+4)}$$

$$= \frac{x^2+6x+8-x^2-5x-14}{(x-6)(x+4)}$$

$$= \frac{x-6}{(x-6)(x+4)} = \frac{1}{x+4}$$

Simplify completely.

$$\frac{2x^2-30}{x^2-9}-\frac{x+5}{x+3}$$

$$=\frac{x-5}{x-3}$$

Given the rational expression, Simplify and decide which value(s) of x are excluded.

$$\frac{x+2}{4x^2+7x+2} = \frac{(x+2)}{(4x-1)(x+2)} = \frac{1}{4x-1}$$

$$x = \frac{1}{4}, -2$$

Simplify the expression completely.

$$(4-2i)(3+6i)$$

$$=24+18i$$

Simplify the expression completely.

$$(5i)(2i)^2$$

$$= 20i^3 = 20 \cdot i^2 \cdot i = -20i$$

Solve the quadratic equation. Be sure to simplify completely, record solution in exact form.

$$6x^2 - 10x - 1 = 0$$

$$x = \frac{5}{6} \pm \frac{\sqrt{31}}{6}$$

Are any of the following a polynomial?

No!

Expression	Why it is not a Polynomial
$3x^2 + \frac{1}{x} + 1$	There can't be a variable in the denominator.
$4 + 2t^{-3} = 4 + \frac{2}{t^3}$	There can't a variable with a negative exponent (variable in the denominator).
$x^2 - \sqrt{x}$	There can't be any variables that are radicals (roots).
$\frac{x+3}{x-2}$	There can't be any variable in the denominator, even if there's one on the top.

Which of the following is a polynomial?

$6x^{-2}$

$1/x^2$

$sqrt(x)$

$4x^2$

$6x^{-2}$	This is NOT a polynomial term…	…because the variable has a negative exponent.
$1/x^2$	This is NOT a polynomial term…	…because the variable is in the denominator.
$sqrt(x)$	This is NOT a polynomial term…	…because the variable is inside a radical.
$4x^2$	This IS a polynomial term…	…because it obeys all the rules.

Solve the equation.

$$|2x-5|-6=15$$

$$x=-8, x=13$$

Solve the equation.

Be sure to check for extraneous roots

$$\sqrt{2x+7} = x-4$$

$$(\sqrt{2x+7})^2 = (x-4)^2$$

$$2x+7 = x^2-8x+16$$

$$0 = x^2-10x+9$$

$$0 = (x-9)(x-1)$$

$$x = 9, x = 1$$

Extraneous root